REMARKS

Considering the rejections on the merits, claims 1-5, 9, 12, 21-23, 28, 33-35, 40 and 44-46 have been rejected under 35 USC 103(a) as being "unpatentable over Christy in view of Storch." Claim 6 has been rejected under 35 USC 103(a) as being unpatentable over the Christy and Storch patents "and further in view of Dumont." Claims 7, 8, 10, 11, 13-20, 25, 26, 29-32, 38, 39 and 41-43 have been rejected under 35 USC 103(a) as being unpatentable over the Christy and Storch patents "and further in view of Greenaway." Claims 24 and 36 have been rejected under 35 USC 103(a) as being unpatentable over the Christy and Storch patents and "and further in view of Schenato et al" while claims 27 and 37 have been rejected under 35 USC 103(a) as being unpatentable over these three references "and further in view of Dumont." These rejections are respectfully traversed.

As set forth in the last response, the Christy patent discloses a multi-layer barcode arrangement which employs wavelength separation in detecting identification codes. The identification codes are provided on a paper or film-like material capable of receiving and retaining clear machine-readable imaging thereon. The first code layer is typically image using toner that is applied by electron beams or techniques such as ink jet printing or photocopying. The toner must be such as to provide a specific spectral response (in the case of the infrared-opaque toner) in contrast to the substrate so that there is no interference with the predetermined wavelength of the code therebeneath. As shown in Figure 1 and in other figures of the reference, the data elements of the surface code must match the code data elements for the underneath layer (i.e., must be directly over the latter) and must be used in conjunction with the special toner for the infra-red reader in order to permit the reader to see through the top barcode and read the barcode therebeneath. In another embodiment (Figure 5), the barcode therebeneath is covered by an opaque overlay which hides the sub-layer code from view, but because transmittal is only at a specific wavelength, reading of the sub-layer can be carried out with an infra-red reader of the corresponding specified wavelength.

As was also pointed out previously, the multi-layer device of the present invention does not use wavelength separation but rather uses an inducement and response approach with some of the sensors employed or a response approach for

other sensors. The invention does not rely at any time on any layer being clear or any code being visible on the surface layer. All codes are preferably disposed underneath an upper layer and hidden for security purposes. To accomplish this, the present invention provides for the use of a sensor selected from the group consisting of x-ray, radar, capacitance, thermal, and magnetic sensors for reading the hidden codes. The Storch patent has been relied on as teaching this aspect of the present invention.

Turning to the Storch patent, the Storch patent relates to an encoding-decoding scheme wherein the primary method used for reading the codes is optical. This is evident from the provision for marking of the objects used as examples only on the surfaces of the objects. Thus, it is respectfully submitted that the comments of the Examiner on page 8 of the Office Action are an unwarranted extrapolation of the actual teachings of the Storch patent. Although the Storch patent mentions other reading methods in addition to optical, these methods relate to codes marked on the substrate of the object, not to reading sub-layer codes. Given the context of the teachings of the Storch patent and the very broad nature of the teachings therein insofar as the present invention is concerned, it is respectfully submitted that it would not be obvious to combine the Storch and Christy patents as proposed by the Examiner.

Turning to the rejection of claim 6, and claims 27 and 37, based on the Dumont patent, the apparatus of this patent is a bulk system of highly questionable operability. There are a number of reasons why the Dumont apparatus would not work. In this regard, it is first noted that if the barcodes were marked with the special inks disclosed in the patent, the random placement of the items in a shopping cart would result in the barcodes being in positions that would overlap or overlay one another or would otherwise interfere with automatic reading thereof. This interference results from the fact that all items would be marked with the same type ink which is to be sensed using one type of scanner. In accordance with one aspect of the present invention, different marking layers and different sensing methods for each layer of code are used so that the layers can be in direct overlay and still will not interfere with reading of a code above or below the code that is to be read. Further, the scanning methods would not work as theorized in the Dumont patent. Ultrasonic waves will not travel through air and produce an image as described in the patent, in that ultrasound is essentially a contact

method and needs some form of coupling medium (e.g., a liquid or gel). Microwaves will travel through air over the distances indicated but do not have the capability of returning sensed data corresponding to that of the code. X-rays will travel through air the distances described but will not yield an image or response in the Dumont apparatus. Air stops x-rays of low intensity, and it is respectfully submitted that the apparatus disclosed in the Dumont patent would not be able to generate the intensity needed to produce a digital image. Infrared rays would work only if heat were to be applied and this would be detrimental to the objects in the cart, so that infrared is essentially an unusable technology for the intended purposes here. Simple IR night vision would not work because a line of sight is required and the randomness of the items in a cart would inhibit the establishment of a line of sight. The use of ultraviolet rays would have the same shortcomings as the optical approach. Magnetic waves would not travel through the air and produce an image as described because the sensor depends on the magnetic fields being emitted from the special ink. The very close proximity or contact required by a magnetic approach in order for it to work renders this approach impractical for use with the Dumont apparatus. Thus, it is respectfully submitted that the teachings of the Dumont patent are basically speculative only, and cannot be fairly relied on to reject the claims presented. Moreover, the Dumont patent clearly does not concern multi-layer systems, and it would not be obvious to apply the teachings of the Dumont patent to the multi-layer barcode arrangement using wavelength separation disclosed in the Christy patent.

Turning to the Greenaway patent, relied on in the rejection of claims 7, 8, 10, 11, 13-20, 20, 25, 26, 29-32, 38, 39 and 41-43, this patent discloses an identification card containing information in the form of optical markings disposed between two protective layers. In contrast, one aspect of the present invention is concerned with the use of a neutral layer to separate substances or materials of different elemental composition that respond to different sensing mechanisms. The purpose of this aspect of the invention is to prevent mixing of elements on a single layer since such a mixture could potentially confuse a sensor and render the code on that layer unreadable. Although the Greenaway patent provides for the use of additional layers as a protective mechanism, one of which can be penetrated by infra-red light, the primary purpose of the layers is to

ensure that the information in the code is destroyed if the layers are separated. Thus, the Greenaway patent and the present invention are concerned with different kinds of separating layers operating in different ways for different reasons. In this regard, the Greenaway layers are suitable only for identification cards whereas the present invention is specifically concerned with direct marking. More generally, it is respectfully submitted that given the actual teachings of the Greenaway patent as described above, it would not be obvious to apply these teachings to the Christy arrangement.

Turning to the claims themselves, the independent claims are patentable for at least the reasons set forth above. In this regard, it is respectfully submitted that it would not be obvious to combine the teachings of the Christy patent and the Storch patent in such a way as to arrive at the present invention as claimed, and that similar remarks apply to the Dumont patent and the other secondary references.

Some of the dependent claims set forth further features that are simply not taught by, nor obvious from, the teachings of any of the references relied on. Specifically, claims 7, 8, claims 25, 26 and claims 38, 39 relate to a feature which is clearly not taught by the references. As an example, claim 7 recites that each of the marking layers comprises "a different medium having characteristics detectable by different sensors of said group," i.e., the group consisting of x-ray, radar, capacitance, thermal and magnetic sensors. Claim 8 recites that each of the marking layers comprises a different medium having characteristics detected by different sensors, the different sensors comprising at least two different sensors of the group consisting of x-ray, radar, capacitance, thermal, magnetic, and ultrasonic sensors. The Examiner disputes the statement that "two different types of sensors are not taught by Christy" and contends that "Christy teaches the use of two different scanner heads 15, 16 (see Figure 2, col 4, lines 30-45), which entails two different scanners." While applicant does not disagree with the latter characterization of the teachings of the Christy patent, this is not a teaching of the present invention as claimed in claims 7 and 8 which require that the sensors be different sensors of the named group. Not only are the two different scanner heads of Christy not sensors of the named group, the scanner heads are both the same kind of sensor, i.e., are not different sensors of the recited group. Thus, these claims are allowable for at least this reason as well as the other reasons set forth above.

Claims 20, claims 31 and 32, and claims 42 and 43 relate to a further feature of the present invention not disclosed by the cited references. As an example, claim 42 recites that the respective identification signal is encoded in at least two marking layers and comprises a respective symbol fragment, while claim 43 provides that the detected symbol fragments are assembled to form a complete symbol. Claim 31 provides that at least two of the marking layers comprises a first symbol fragment and a second symbol fragment while claim 32 recites a process for assembling the first and second symbol fragments after detection to thereby form a complete symbol. It is simply not seen where these features are disclosed in the cited references and it is respectfully submitted that these features clearly are not disclosed in the Greenaway patent used in combination with the Christy and Storch patents in rejecting the corresponding claims.

Claims 24 and 36 relate to the use of an x-ray sensor having tomographic capabilities for reading the identification signals from each of the marking layers. This feature is not disclosed in any of the references including the Schenato et al patent relied on as disclosing this feature. The Schenato patent was discussed in some detail in the last response and while that discussion will not be repeated here, it is noted that this patent relates to ultrasonic detection and quite simply does not relate to the use of an x-ray sensor with tomographic capabilities.

Allowance of the application in its present form is respectfully solicited.

Respectfully submitted,

OCT 24 2003

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